

## Managing Used Computers

### A Guide for Businesses & Institutions

#### Computers everywhere!

The computer, not very long ago an exotic addition to the workplace, has become an indispensable part of daily life. Computers are getting faster, smarter and cheaper. Some studies conclude that a new generation of computers is born every 18 to 24 months.

The rapid turnover in computer technology is having a troubling side effect: each year millions of computers come to the end of their useful life. A recent study estimates that about 40 million computer systems become obsolete in the U.S. annually. By 2010, about one billion PCs will likely have become obsolete!

It's estimated that three-quarters of all computers ever purchased in the U.S. are currently stored in warehouses, attics and office closets. Some are being recycled. Of those computers that become obsolete, only 5-15% are recycled. The rest are ending up in landfills or incinerators.

#### Why are used computers a potential problem for businesses & institutions?

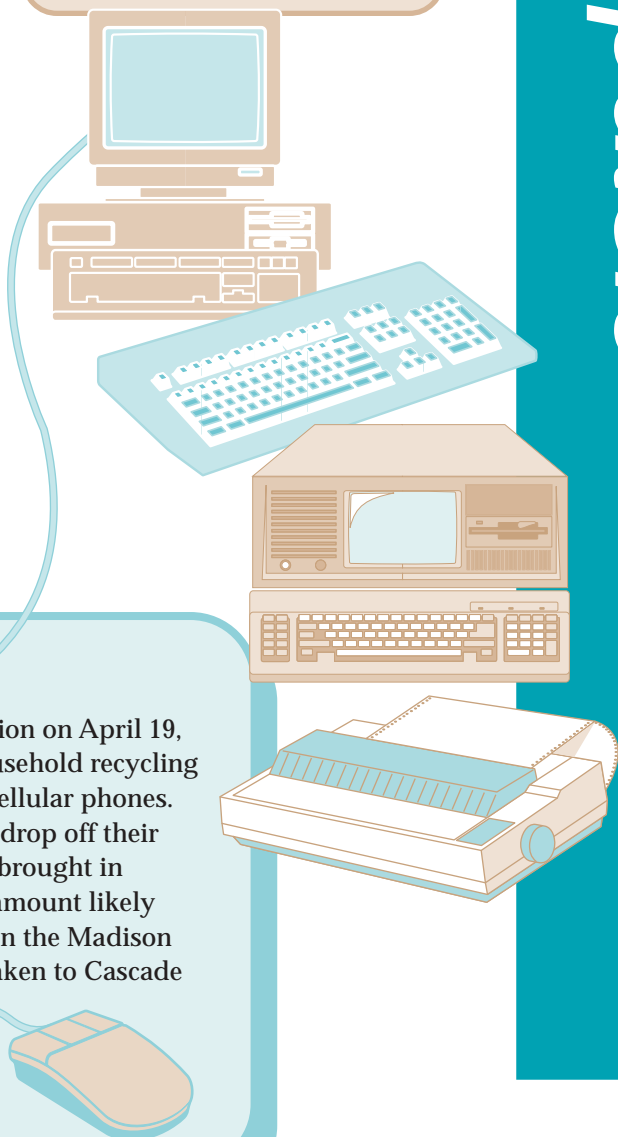
Businesses and institutions need to be concerned about what happens to their used computers because they contain toxic metals which may make them subject to full hazardous waste regulation if landfilled or incinerated. However, the good news is that these same computers are subject to reduced hazardous waste regulation if they are reused or recycled.

#### Madison Rounds Up Old Computers

The City of Madison held a one-day computer collection on April 19, 2003. This was the eighth time Madison has hosted a household recycling event for computers, televisions and, for the first time, cellular phones. Radio and TV ads alerted area residents that they could drop off their used computer equipment for free. In six hours citizens brought in approximately 55,000 pounds of used equipment. That amount likely represents about 2% of the stored computer equipment in the Madison metropolitan area. The majority of the equipment was taken to Cascade Asset Management where it was disassembled and sold as scrap or properly disposed. Equipment in working condition was refurbished and donated to local non-profit organizations.

#### Examples of Used Computer Components:

- Central Processing Units (CPUs)
- Monitors
- Printers
- Keyboards
- Laptops
- Peripherals (modems, mice, storage drives, etc.)
- Terminals
- Mainframes



## Why can used computers be regulated as hazardous waste?

The hazardous waste toxicity characteristics is defined by a common laboratory test known as the toxicity characteristics leaching procedure, or TCLP, and by regulatory levels for 39 chemicals, including 8 metals. Computer monitors, central processing units (CPUs), keyboards and printers all have printed circuit boards that contain metals and likely exceed toxicity characteristic levels. In addition, lead in the monitor's cathode ray tube (CRT) generally causes it to exceed the toxicity characteristic level for lead. (Lead usually makes up about 4-8 lbs of the total weight of the monitor.)

Wisconsin's hazardous waste regulations prohibit businesses and institutions from disposing waste computers in solid waste landfills and incinerators if they exceed toxicity characteristic levels. If computer components are burned or landfilled, the heavy metals in them can be released to the environment and threaten human health and the environment. Computers are known to contain beryllium, cadmium, chromium, gold, lithium, lead, mercury, nickel, silver, and zinc.

Businesses and institutions that do not recycle their used computers are subject to applicable solid and hazardous waste rules, including the hazardous waste generator requirements in chapters NR 600 - 685, Wisconsin Administrative Code. They may also be required to obtain licenses for storage and transportation of their waste computers from the Department of Natural Resources (DNR).

### What are the toxic and hazardous materials in your computer?

Lead, cadmium and other metals  
*from cathode ray tubes*  
found in monitors and terminals

Chromium, lead, beryllium, mercury,  
cadmium, nickel, zinc, silver and gold  
*from printed circuit boards*  
found in all components

Nickel, cadmium, lithium, mercury and lead  
*from batteries*  
found in CPUs, laptops & portable printers

Mercury  
*from relays and switches*  
found in CPUs, monitors and terminals  
Mercury may trip the TCLP from laptop LCDs.

## How are regulations reduced for businesses and institutions that recycle their used computers?

Although used computer components contain toxic and hazardous substances, they can be given another life when reused or recycled. (A computer component that is fully functional and is used for its original intended purpose is not a waste and therefore is not regulated by DNR.) Wisconsin has reduced the hazardous waste regulation of used CRTs when they are legitimately recycled.

Businesses and institutions may store and recycle their used computer monitors and terminals as follows:

- Intact CRTs may be stored at a facility without being placed in a building or container as long as they are not speculatively accumulated or managed in a manner that constitutes disposal.
- Businesses and institutions may safely collect and transport their own used computers from several locations to a central facility, or to a Wisconsin recycler, without a solid or hazardous waste transporter's license or a hazardous waste manifest. However, if the computers are transported out-of-state, those states may require a transporter's license, manifest and compliance with any other applicable solid and hazardous waste requirements.
- The DNR, by using its enforcement discretion, is allowing this type of reduced regulation to apply to intact and broken monitors and terminals to encourage their recycling.

## What regulations apply to a used computer transporter or recycler?

It is not necessary to have a solid or hazardous waste transportation license from the DNR in order to transport used computers to a recycler. Used computer transporters should check with the Wisconsin Department of Transportation about the applicability of Hazardous Materials Transportation regulations.

Regulations affecting computer recyclers are reduced to encourage recycling:

- To be exempt from full hazardous waste regulation, monitor, terminal and cathode ray tube recyclers should manage their CRTs as follows:

**Storage:** Broken or processed CRTs must either be stored in a building with a roof, floor and walls, or placed in a container (*i.e. a package or a vehicle*) that is constructed, filled and closed to minimize identifiable releases of CRT glass to the environment (including fine solid materials). CRTs undergoing processing are subject to the same requirements for storage, labeling and speculative accumulation as stated above for CRTs destined for recycling. Speculative accumulation of CRTs is not allowed.

**Labeling:** Each container in which broken or processed CRTs are contained must be labeled or marked clearly with

one of the following phrases: “waste cathode ray tubes - contains leaded glass” or “used cathode ray tubes - contains leaded glass.” It must also be labeled: “do not mix with other glass materials.”

**Processing:** All CRTs must be processed within a building with a roof, floor and walls, and no activities may be performed that use temperatures high enough to volatilize lead from CRTs.

**Record keeping:** Facilities accumulating or processing CRTs must keep records for at least three years to verify that CRTs are being recycled and to demonstrate that they have not speculatively accumulated CRTs.

**Transportation:** All broken or processed CRTs must be transported in a container that meets the requirements described in the storage and labeling standards above.

**Speculative Accumulation:** All CRTs are subject to speculative accumulation prohibitions as defined in ch. NR 600.03 (211) Wis. Adm. Code. Speculative accumulation means that accumulating materials before recycling is not allowed unless the person accumulating the material can show that the material is potentially recyclable and has a feasible means of recycling. Also, the amount of material that is recycled or transferred to a different site for recycling must equal at least 75% by weight or volume of that material accumulated over the beginning of the period. CRT glass sent to CRT glass to glass recycling or lead smelting is not a hazardous waste unless it is speculatively accumulated. Facilities managing CRTs shall keep records for three years to verify CRTs have been recycled and have not been speculatively accumulated.

- Wisconsin facilities that process CRTs for recycling must follow these enforcement management guidelines. Wisconsin facilities, which fail to follow these, are subject to the hazardous waste recycling requirements in ch. NR 625, Wis. Adm. Code.
- Computer components other than monitors are exempt from full hazardous waste regulation if the circuit boards they contain are recycled as scrap metal and if the generator complies with s. NR 605.05 (2)(a), Wis. Adm. Code.

Recycling facilities that receive computers from businesses, institutions or households cannot legally dispose components or parts, which have the hazardous waste toxicity characteristics, in solid waste landfills or incinerators.

## *What are the management options for used computers?*

Options are available that give old computers a new lease on life, spare the expense and hassle of managing them as fully-regulated hazardous waste and safeguard the environment. The following list provides some ideas to get you started.

**Computer Recyclers:** There are a number of computer recycling centers and electronics manufacturers in Wisconsin and the Midwest. These businesses disassemble computers, salvage parts and sell reclaimed materials. Before

**The Hazardous Waste Exemption for Scrap Metal that is Recycled** (ss. NR 605.05(2)(a) and 600.03(211), Wis. Adm. Code) requires:

- The generator to provide, at the DNR's request, information about the scrap metal being recycled, the recycling facility and the market for the scrap metal;
- That scrap metal not be used in a manner constituting disposal, or used to produce products that are applied to the land; and
- 75% of the scrap metal to be recycled, or transferred to a different site for recycling, each calendar year.

choosing a computer recycler, check to make sure the firm meets applicable regulatory requirements; has the appropriate environmental, safety and health programs; and has disposal and recycling outlets for the recovered materials. To protect your company, make sure the facility handling your obsolete computers is managing them in an environmentally safe way. A listing can be found in the DNR's Wisconsin Recycling Markets Directory or in the Wisconsin Review of Electronic Recyclers. Both of these tools can be found on the DNR Waste Management web site. Being listed in the Markets Directory does not imply endorsement by the DNR. You may contact your local DNR regional waste management specialist to find out if any enforcement actions may have occurred or are pending against a specific Wisconsin recycler. An e-recycler checklist is also available on the DNR Internet as of March 2004. This checklist can be used to verify if a recycler will meet your environmental concerns and needs.

**Computer Donation:** Donating usable computers to a school or nonprofit group benefits both the receiving organization and the company making the donation. The depreciated value of the donated equipment may be tax deductible. Check with your tax consultant or the IRS. A new provision in the tax code allows for a full deduction of the purchase price of equipment up to two years old, plus deductions of installation and transfer costs, if the equipment is donated to K-12 schools or foundations supporting those schools. The website; <http://www.pcsforschools.org> may provide some useful information. Check first with the potential recipients to make sure they can use your equipment. A list of international refurbishing programs (East-West Foundation, Detwiler Foundation, etc.) and local club programs can be found on the Internet.

**Resale:** Some companies sell or offer their used computers to employees. Others sell or give them to computer repair/resale businesses. Check the Yellow Pages listings for “Computers: Sales and Service” to find these companies.

**Leasing Companies:** Original equipment manufacturers (OEMs), such as IBM, Digital, Dell, Compaq and Gateway, offer leasing options. Many third party leasing operations, that purchase and then lease OEM equipment, are listed on the

Internet at: <http://www.remarketing.com/html/leasing.html>. Contact companies directly for more information. Additionally, several computer manufacturing companies have started take-back or recycling programs. Information on these programs can be found at the manufacturer's website on the Internet.

**Asset Management:** Asset management companies provide a full-service surplus electronics collection, component recovery and refurbishing program for corporations. A list of these companies can be found at: <http://www.remarketing.com/html/>.

**Materials Exchange:** List the items on a materials exchange that finds users for surplus materials. In Wisconsin, contact the Business Materials Exchange (BMEX) at (800) 364-3233 or go to their web site: <http://www.bmex.org>.

## Used Computers from Households

Used household computers are not subject to hazardous waste regulation if they are managed together with other household wastes. However, in Wisconsin, used household computers that are managed separately by a person who is not a member of the household are subject to full hazardous waste regulation if they are not reused or recycled. Check with your municipal government to see if there are local restrictions on waste computer management. (A number of states have banned or are considering a ban on landfilling or incinerating CRTs from any source, including households.) Homeowners are *strongly* encouraged to recycle their used computers by taking advantage of the options described for businesses.

## Resources

**Regulatory Questions:** Contact DNR regional waste management staff with questions about computer recycling or disposal.

Fitchburg – (608) 275-3266  
Milwaukee – (414) 263-8500  
Green Bay – (920) 492-5916  
Spooner – (715) 635-2101  
Rhinelander – (715) 365-8900  
Eau Claire – (715) 839-3700



**List of Computer Recyclers:** A current list of businesses and nonprofits that accept computers for reuse or recycling information is available on the Internet at: <http://www.dnr.state.wi.us/org/aw/wm/markets/>.

**The DNR Waste Reduction and Recycling Demonstration Grant Program** provides grants for innovative projects covering up to 50% of total costs. For more information call (608) 267-0494.

## What to Ask When Selecting a Computer Recycler

- Does the firm have the necessary state and local permits?
- How does the facility manage the materials and wastes?
- Does the firm have contracts with foundries and scrap dealers for its metals? With precious metal refiners for its circuit boards? Has the company completed an environmental audit of these facilities?
- Is there a program in place for dealing with cathode ray tubes?
- Can the firm provide traceability of the materials it processes? Can this be audited by customers?
- Does the firm have sufficient liability insurance coverage?
- Does the firm have a Hazard Communication Plan, Worker Safety Training Program and Right to Know Training Program?
- Is proper protective equipment available and used by employees?

Taken from "Recycling Used Computers and Electronics," Solid and Hazardous Waste Education Center, Waste Education Series, 725.JK.9801

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